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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/706,720	11/12/2003	Steve Montellese		7238

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EXAMINER

HOLTON, STEVEN E

ART UNIT	PAPER NUMBER
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2629

MAIL DATE	DELIVERY MODE
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10/03/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/706,720

Applicant(s)

MONTELLESE, STEVE

Examiner

Steven E. Holton

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 8/8/07.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 13-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 13-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office Action is made in response to applicant's amendment and request for continuing examination filed on 8/8/07. Claims 1-4 and 13-21 are currently pending in the application. An action follows below:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-4 and 13-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arnon (USPN: 6650318) in view of Bell (USPN: 7259747).

Regarding claims 1 and 16, the Examiner notes these claims are drawn to a device and associated method of operation and are considered together, Arnon discloses an input detection system comprising a system for projecting a holographic image onto an area (Fig. 2, element 65), a reception device that registers the imaged area and responds to the wavelength of light of the projected interface (Fig. 1, element 40; col. 6, lines 45-46).

However, Arnon does not expressly disclose determining a difference pattern between an interference pattern for the original holographic image and an interference pattern for the image sensed by the reception device, and using the difference pattern to project a modified holographic image that represents a change in the original holographic image.

Bell discloses an optical input system wherein the difference between an originally projected image and a current image is used to determine interaction with a projected image. Bell discloses providing a pattern over a sensing surface (col. 7, lines 48) and then finding the difference between the original pattern and the currently detected pattern to determine the location of an object interacting with the projected image area (col. 7, lines 49-64). Bell further discusses the pattern method of detection in Fig. 5 and col. 8, lines 49-67. Bell then discloses using the determined location to as a basis for interacting with a projected image (Fig. 6).

At the time of invention it would have been obvious to modify the teachings of Arnon with the teachings of Bell to produce an interactive holographic system that detects interaction based on a difference between a projected pattern and a sensed pattern. The Examiner notes that although Bell deals with non-holographic images it would be obvious to one skilled in the art that holographic and non-holographic images will produce a light pattern on a camera. A 'background' image of a holographic image could be determined just as readily as determining a background image of a non-holographic image. Thus, the difference method described by Bell could be utilized using a holographic pattern just as easily as a non-holographic pattern. Further, the light detectors used by Arnon (Fig. 8, elements 108 and 110) could be replaced by a single or multiple cameras to take images of the interaction area. This would be similar to the off angle system shown by Bell in Fig. 4. Rather than detecting reflected light from a finger and triangulating the position as described by Arnon, an image of the entire detection area could be compared with a background image to determine the

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position of any interaction using the difference method of Bell. The rationale for combination would be to replace one method of position determination with a different method of position determination to produce the same results. Thus, it would have been obvious to combine the teachings of Arnon and Bell to produce a holographic device with image interaction as described in claims 1 and 16.

Regarding claim 2, the Examiner notes that reflective solid state imaging devices are well known in the art. Digital micromirror devices (DMDs) are well-known as being used to redirection of light for the purposes of projecting images and solid state devices. It would have been obvious to one skilled in the art that a DMD or similar reflective solid state imaging device could be used to project holographic image using the light beam system of Arnon.

Regarding claims 3 and 14, the Examiner notes that solid state sensing devices, such as CCD optical sensors are well known in the art and are commonly used in digital camera technology. It would have been obvious to one skilled in the art to use a CCD or other type of solid state sensing device as the camera device described by Bell for receiving an image to be processed by a computer.

Regarding claim 4, Arnon discloses the image representing a keyboard (Fig. 6) and also as a game (Fig. 17).

Regarding claim 13, the Examiner notes that transmissive solid state imaging devices such as liquid crystal shutters are well known in the art for use as part of image projection systems. It would have been obvious to one skilled in the art that a liquid

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crystal shutter or similar type of transmissive solid state imaging device could be used as part of the holographic projection system described by Arnon.

Regarding claim 15, the Examiner states that producing a holographic image of a steering wheel would be a matter of design choice for one skilled in the art. Arnon clearly shows projecting a variety of holographic images of different layouts and shapes (Figs. 3A – 3E, 16 and 17). It would be a matter of design choice for one skilled in the art to display a steering wheel or any other holographic image depending on the type of interactive holographic display desired.

Regarding claim 17, Arnon discloses displaying original holographic images that are user input devices (Figs. 3A – 3E). Bell discloses that a difference between an original displayed image (background) and a detected image is caused by a user interacting with a projected image. The difference between a detected image of a holographic input device shown by Arnon and a person interacting with a projected holographic image would produce a similar difference between the original image and a detected image and the difference methods of Bell could be used to determine the interaction of a user with the projected input device.

Regarding claims 18 and 19, Arnon discloses displaying a keyboard (Fig. 3A) and the Examiner states that producing a steering wheel would be a matter of design choice for one skilled in the art.

Regarding claims 20 and 21, the Examiner states that the methods of feature space analysis and bit map comparison to determine the difference between images are

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well known in the art and it would be a matter of design choice for one skilled in the art to use either technique for determining the differences between two images.

Response to Arguments

3. Applicant's arguments with respect to claims 1-4 and 13-21 have been considered but are moot in view of the new ground(s) of rejection.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven E. Holton whose telephone number is (571) 272-7903. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Steven E. Holton
Division 2629
September 26, 2007

AMR A. AWAD
SUPERVISORY PATENT EXAMINER

